

# 1 Introduction

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This report documents the general procedures used to collect bathymetric and sediment data for environmental studies conducted as part of the Upper Mississippi River System (UMRS) Navigation Feasibility Study. Several biotic and physical study components of the Navigation Feasibility Study used bathymetric and sediment information. These studies ranged in geographical extent from small areas selected for intense modeling to the entire UMRS for estimating systemwide effects of navigation.

Bathymetric data were obtained at two different levels of spatial resolution. Generation of poolwide bathymetric data from interpolation in a Geographical Information System (GIS) had been completed in three study pools of the Long Term Resource Monitoring Program (LTRMP) prior to initiation of the study. Although poolwide coverage of bathymetry for the entire UMRS could be used by many study components, completion of a systemic poolwide database within the time frame of the study was an unrealistic goal. Therefore, poolwide coverages of bathymetry were completed only for two additional pools, those being previously uncompleted study pools of the LTRMP. To meet the needs of systemic studies, the remaining pools of the UMRS were surveyed along transects at 1.6-km (1-mile) intervals in the main channel and at all connections to off-channel areas. These data were used only to represent long “cells” at 1.6-km (1-mile) intervals and no interpolation of a surface was performed with these data.

Data on sediment composition were also needed at similar levels of resolution. Detailed two-dimensional (2-D) numerical models of sediment transport were developed for selected areas, and existing sediment characteristics within the modeled area were needed. In addition, systemic impacts of navigation were investigated, and sediment characteristics were needed for these investigations. To meet these needs, sailing line and nearshore sediments in the main channel were collected and characterized. The physical characteristics determined for the sediments also varied depending on the scope of the studies, ranging from visual classification for systemic studies to sieving to determine particle size fractions for sediment transport modeling.

Several publications include detailed documentation of methods and standards for collecting bathymetric data and sediment analysis. The U.S. Army

Corps of Engineers (USACE) has published a document that discusses extensively the methods and the theory behind the technology for hydrographic surveys (Headquarters, U.S. Army Corps of Engineers, 1994). The general methods reported here can be greatly supplemented by the detail provided in the USACE document. Similarly, standard methods for sediment analysis provided by the American Society for Testing and Materials (ASTM) provide details of analytical procedures. For some laboratory analyses deployed for the study, the ASTM methods were completely followed and methods are simply referenced. Although most of the methods used for the study are in published documents, this report includes specific methodology that needs to be reported to provide the information to data users.